



# Environmental Planning, Energy Efficiency and Renewable Energy Initiatives in Newport, Rhode Island



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# PROGRAM AND PROJECT LEADERS

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# ENERGY INITIATIVES



- Naval Undersea Warfare Center
  - Conservation Measures
  - Research
  - Renewable Energy
- Naval Station Newport
  - Conservation Measures
  - Renewable Energy
- Environmental Assessment for Wind Energy in Newport, Rhode Island



An aerial photograph of Naval Station Newport, Rhode Island. The station is situated on a peninsula, with a large shipyard and various naval facilities. A long bridge spans the water to the left. In the foreground, there is a large green golf course with several ponds. The background shows more of the harbor and distant islands.

Naval Station Newport

Naval Undersea Warfare Center

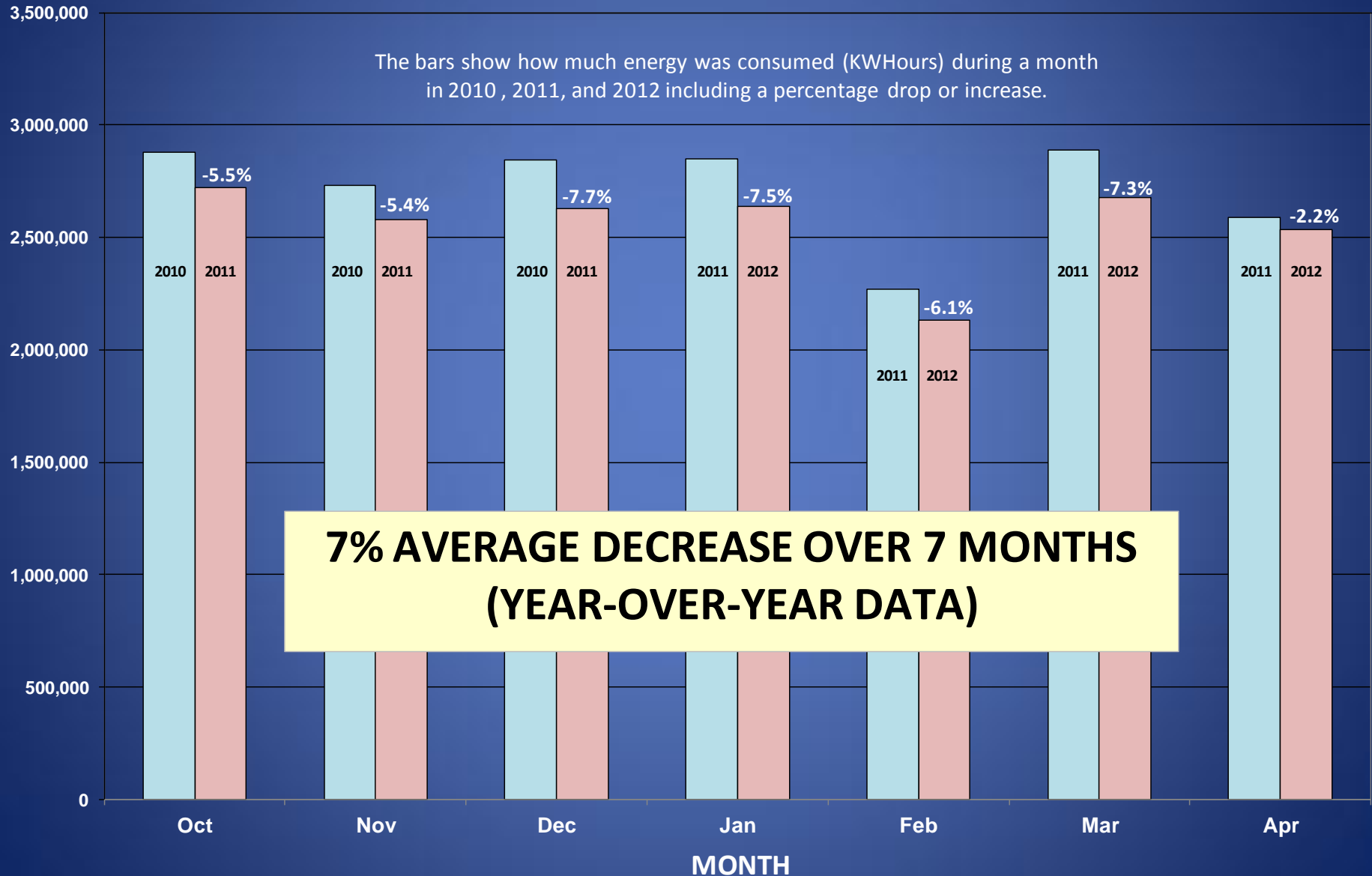


# Energy Conservation

- Efficient Lighting Upgrades
- Lighting Shutoffs Through Occupancy Sensors
- HVAC/Temperature Setbacks
- Efficient HVAC Equipment
- Power Saving Measures For Personal Computers
- "Lean Lab" Non-essential Equipment Shutoffs
- Power Saving Office Shut-down Procedures
- "Smart" Digital Power Meters - Building Level
- Cultural Change Through Continuous Feedback



## MONTHLY POWER CONSUMPTION - NUWCDIVNPT





# LEAN LAB



**Goal:** reduce electrical consumption in RDT&E labs utilizing high power consuming shipboard equipment in temperature controlled laboratories.

## PROCESS

- Formed lean team - representatives from each department
- Inventoried all lab equipment - commercial and military
- Define current state - nameplate power and operational hours
- Define future state - reduced hours of operation
- Execute future state and measure results

# ENERGY CONSERVATION



## "Smart" Digital Power Meters - Building Level

- Collect data weekly from building level "smart" meters
- Analyze data for effectiveness of energy reduction program
- Generate weekend, weekly, and monthly charts for each building
- Distribute charts to each department every week
  - Reinforces positive habits
  - Shows that individual/collective actions do have an impact
  - Provides visibility into building consumption

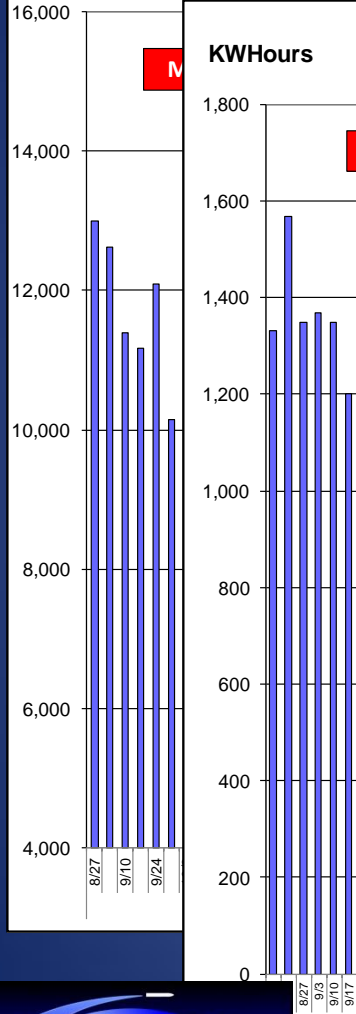


# Continuous Feedback Using "Smart" Meter Data

**BLDG 1371 - WEEKEND POWER CONSUMPTION**

Fri 4:30 pm to Mon 7:30 am

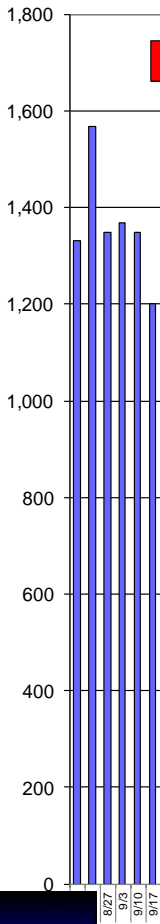
KWHours



**BLDG 679 - WEEKEND POWER CONSUMPTION**

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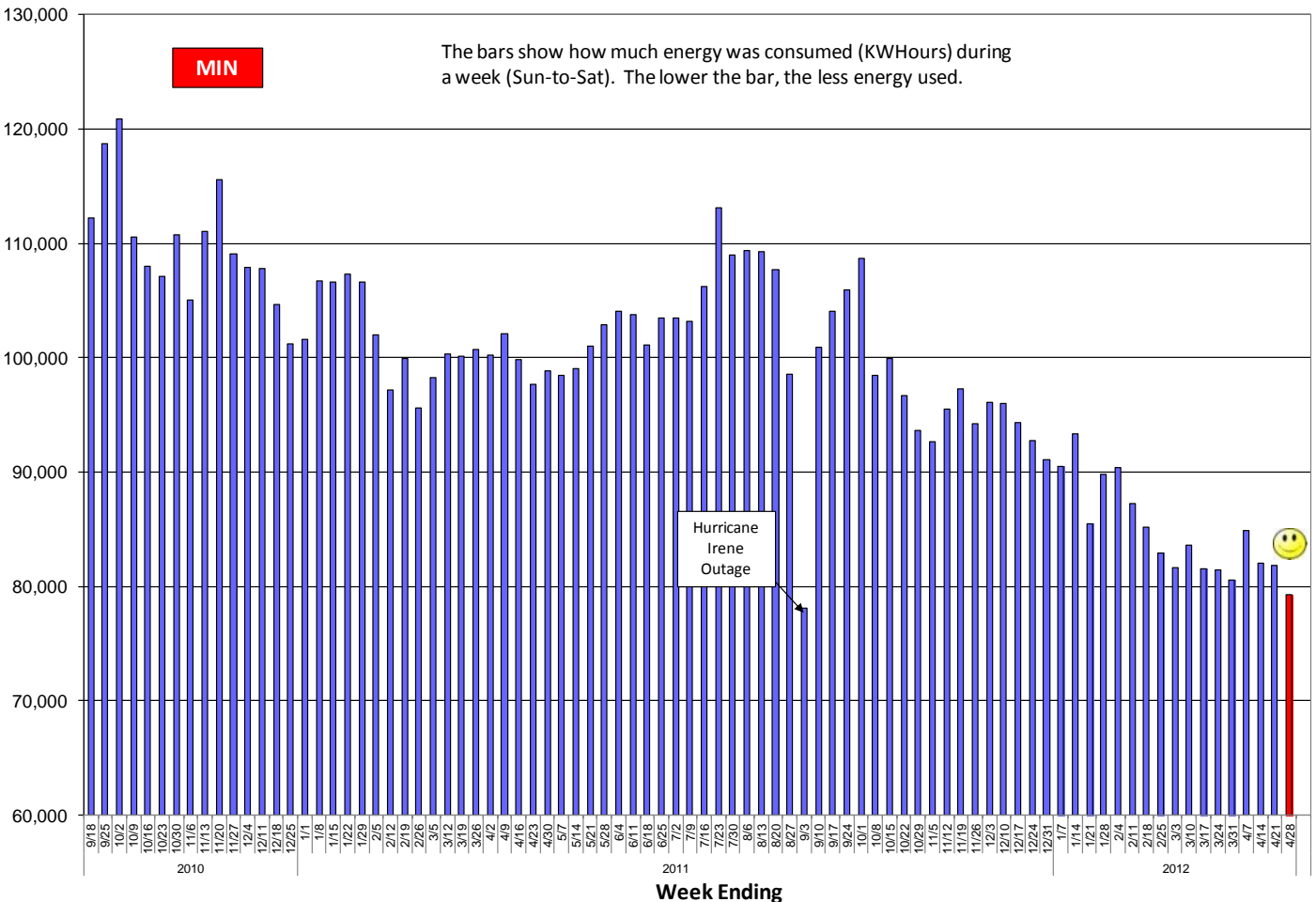
KWHours



**BLDG 1258 - WEEKLY POWER CONSUMPTION**

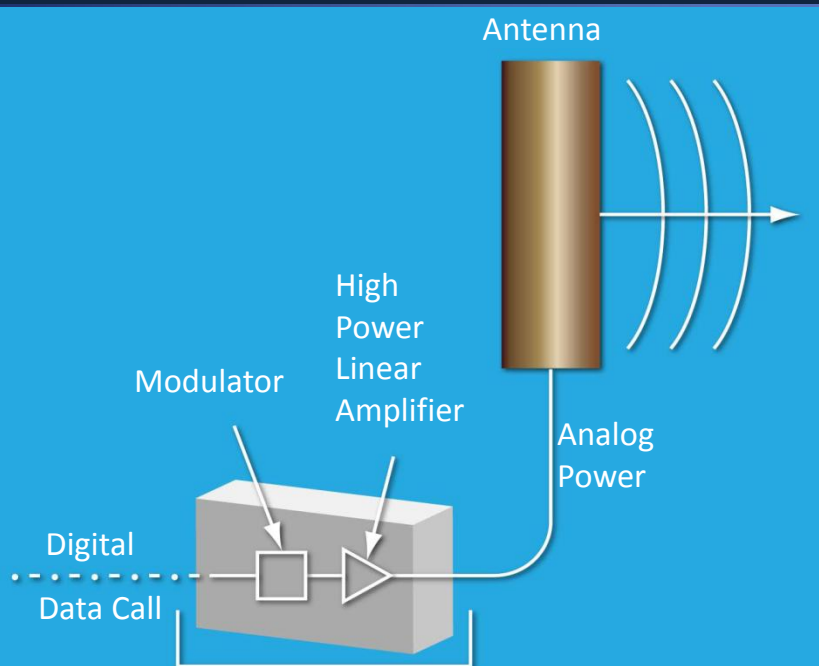
Sun 12:00 am to Sat 11:45 pm

KWHours

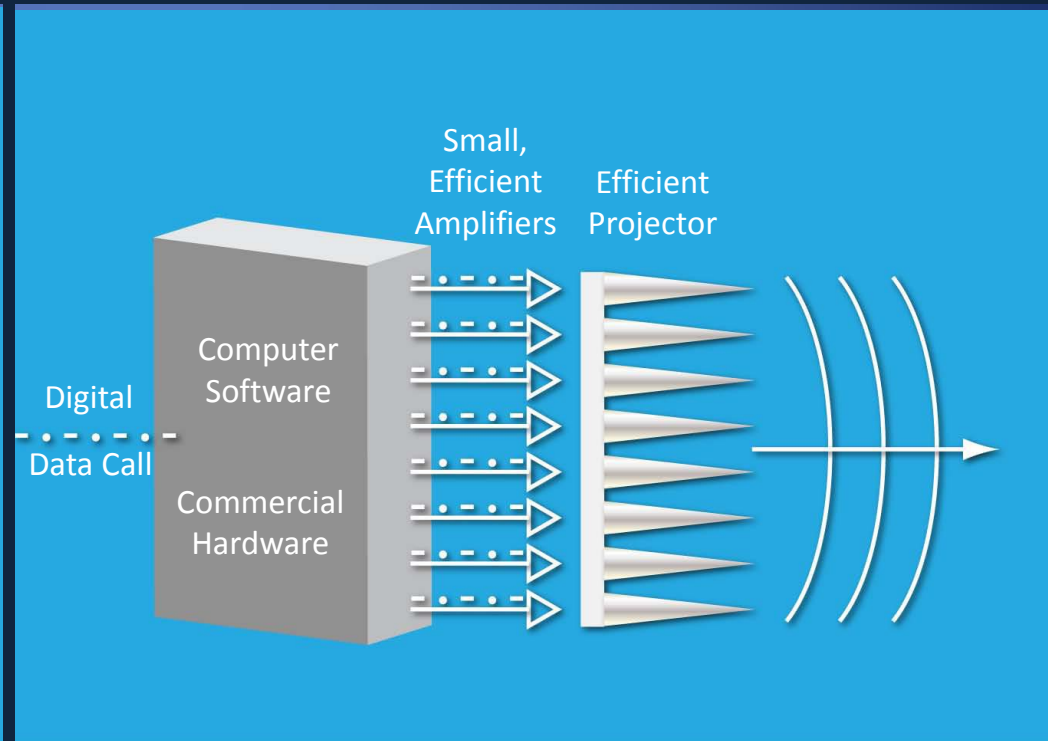


# WHITE NAIL RESEARCH

## Cellular Transmitter



## White Nail Transmitter



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# Renewable Energy

- Solar thermal panels – 25 years
- Solar Trombe wall
- Electric vehicles
- AUTECH Wind Turbine
- AUTECH Direct Solar Hot Water System



# AUTEC WIND TURBINE

**A \$5.6 million wind turbine has been funded by the Energy Conservation Investment Program (ECIP) for AUTEC on Andros Island in the Bahamas.**

**Preliminary study indicates installation at Site 1 is feasible:**

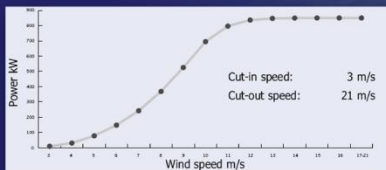
- Without significant impact on operations
- 213 ft hub height

**Benefits:**

- Annual savings of \$400,000 after accounting for maintenance costs
- Typically powers 335 homes
- Anticipating fossil fuel consumption reduction of up to 30% with a corresponding reduction in greenhouse gas emissions
- Promotes green energy without degrading mission effectiveness or quality of life

**Design Phase: April 2010**

**Wind Turbine Installation: FY12**



**Typical Power Curve**



**AUTEC Site 1  
Andros Island**



**Supports AUTEC's goal of becoming a net-zero-energy installation**





# AUTEC DIRECT SOLAR HOT WATER SYSTEM



## Current Situation:

- Constantly increasing fuel prices have translated into higher utility costs.
- Always moving toward compliance with federal energy goals and mandates.
- Site 1 power plant average diesel burning rate of 1.3 million gallons/year costs roughly \$3 million.

## Benefits to AUTEC:

- Annual electric power reduction of 2,994 KWH (61%) on the electric hot water heaters.
- Annual savings of \$778.55 per housing unit. Initial purchase and installation cost \$5,150 per system.
- Return on investment of 6.61 years.



# NAVAL STATION UTILITIES

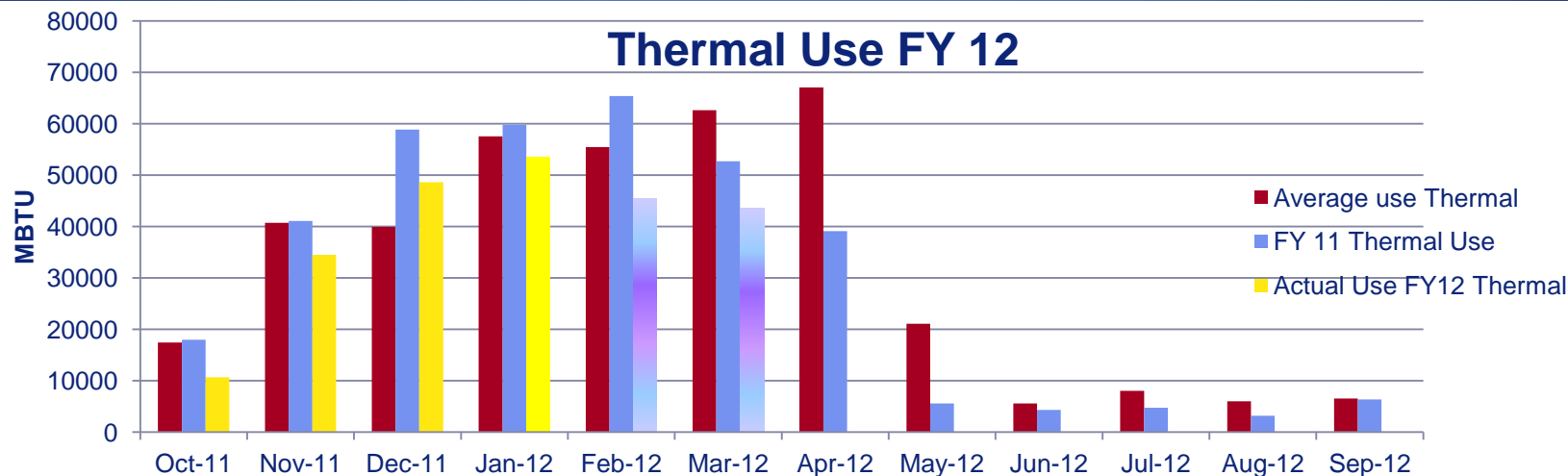
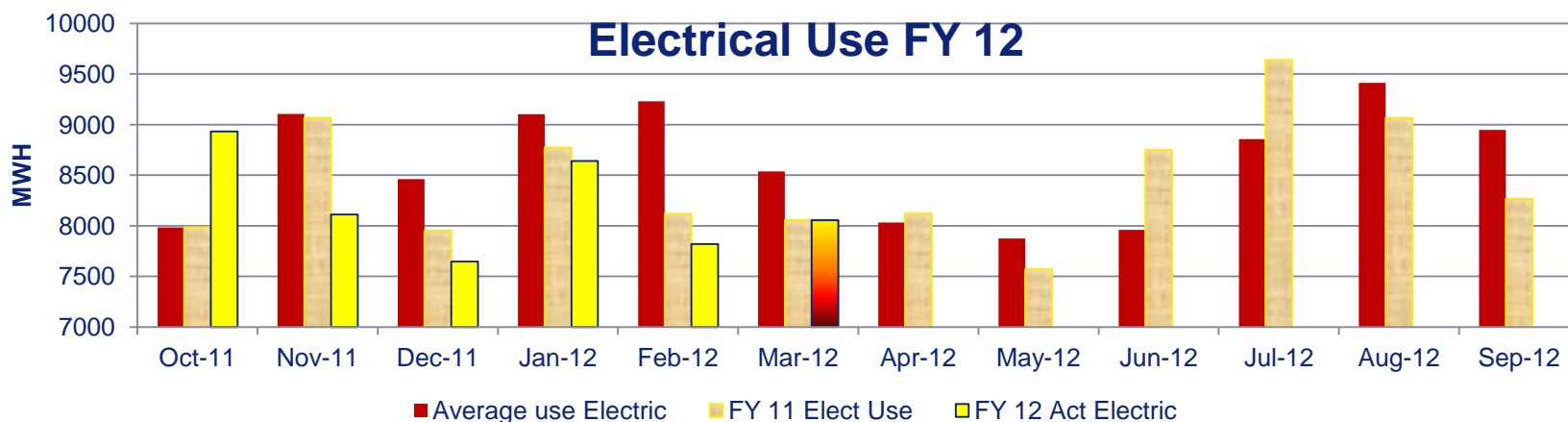
**Awareness** – includes knowing consumption data, understanding tendencies, & defining places to begin “low hanging fruit”

## Utilities - Current Uses

Electrical	103,500 MWH	\$9.8 Million
Thermal	388 MBTU	\$5.8 Million
Water	271 Kgal	\$1.4 Million
Sewer	400 Kgal	\$1.6 Million
Fuel	71 MBTU	\$1.2 Million
Total		\$19.8 Million



# TRENDS OF USAGE







# Energy Conservation

High energy usages may be because of:

- Mission
  - Climate control requirements
  - Operations
- Facility Size
- Poor Housekeeping



## FY 11 Top 10 Consumers

Buildings	Total Annual Cost
NUWC 1320-CC	\$817,786
NUWC-1259-CC	\$687,720
NUWC-1258-CC	\$605,475
NWC-27-CHI	\$570,607
NUWC-1171-CC	\$524,875
NETC-197-CP	\$425,411
NSNPT-68-Total	\$421,626
NETC-440-CP	\$416,135
NETC-291-CP	\$394,815
NWC-991-CHI	\$364,498



# ENERGY EFFICIENCY

- **Conservation**
  - LED lights - Used in the REC center
  - Induction lighting - Used at Gate 17
  - Reducing hallway lighting
- **Demand Reduction**
  - Sensors & controls that adjust ventilation
    - Focus on conference rooms, classrooms, & auditoriums
    - Honeywell ESPC project completed in 440CP Perry Hall
  - Automatic water shutoffs
- **Improved Command Energy Management**
  - Understanding peak demands relate to air condition loads
  - Advanced Metering Infrastructure (AMI)



# RENEWABLE ENERGY

- **Renewable Projects**
  - Solar Thermal Collectors
  - Solar Vent Preheat (Solar wall)
  - Photovoltaic Installation
  - Building Level Wind Turbines
- **Alternate Fuels**
  - Using fuels that are renewable and sustainable
  - Newport uses 22 electric and 3 hybrids cars
- **LEED**
  - Eifs (Stucco) System with high insulating value
  - Using insulated concrete form wall construction to increase R values, low E windows, bike racks, etc.







# RENEWABLE ENERGY

- Wind Turbine Proposal
  - 9MW project at up to 12 sites
  - Estimated >\$20M savings over project life cycle
- Environmental Assessment





# PURPOSE AND NEED

- EPAAct 2005
- EO 13423
- NDAA 2010
- NAVSTA is one of the largest electrical users in RI
- Spending \$12 million annually for electricity
- Current estimates
  - 26% of current annual electrical consumption
  - \$3 million in annual savings.

# PROJECT HISTORY

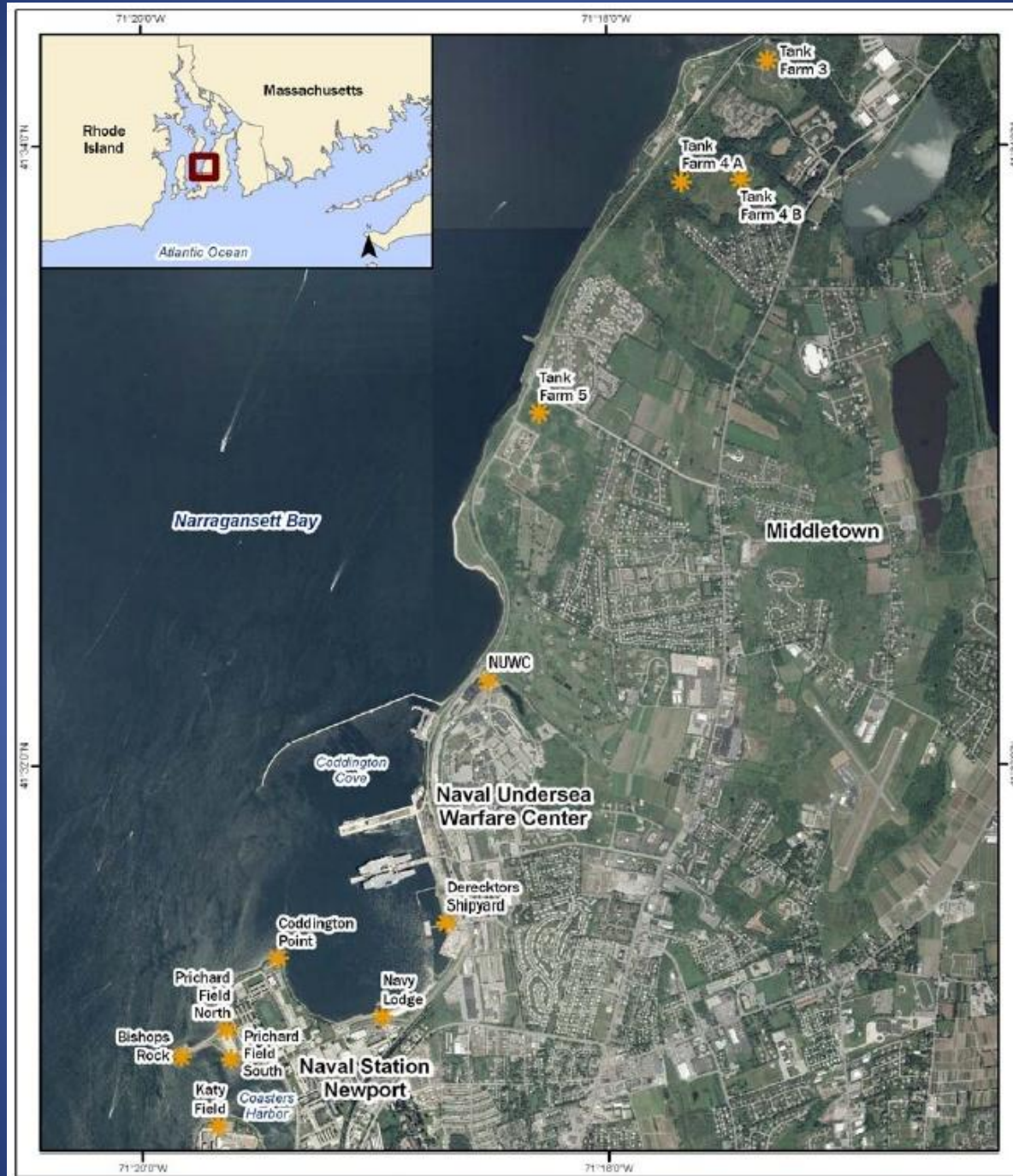


- Initial project envisioned in 2006
- Limitations investigated in July 2009 (set backs, sound, flicker, FAA [height], ice throw, etc)
- 20 initial sites selected
- Wind measurement study in May 2010
- Environmental Assessment under National Environmental Policy Act (NEPA) was initiated in August 2010



*Met Tower*





# NEPA

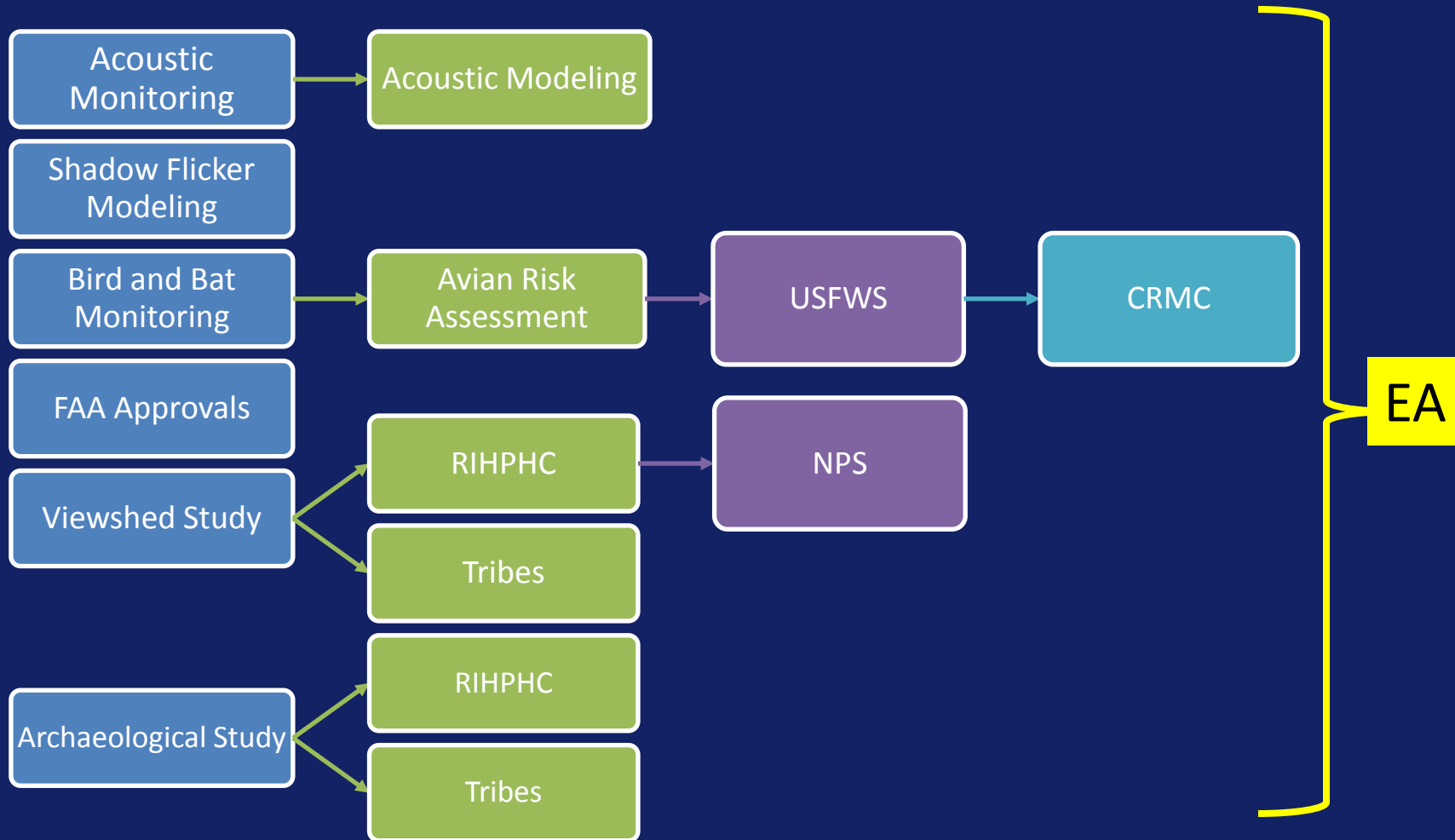


- Background Studies for Environmental Assessment
  - Avian Radar Analysis
  - Viewshed Study
  - Noise Analysis
  - Shadow Flicker Analysis
  - Public Meeting
  - Marine Mammal Study and Technical Report
  - Phase 1 Archaeology investigation of potential sites
- External Consultations





# EXTERNAL CONSULTATIONS





# PROJECT PROGRESS

- Repowering America - Oct 2009
- Federal Aviation Administration Obstruction Evaluation - Dec 2009  
Renewed Jan 2012
- Business Case Analysis - Feb 2011
- Wind Energy Study - Aug 2011
- Interconnection Study - Feb 2012
- Environmental Assessment (FONSI) - August 2012
- Soil Boring – August 2012



FAA Analysis Map

# PROJECTED TIMELINE



## Step 1 - NEPA

*June 2010 – August 2012*

## Step 2 - Develop and solicit Power Purchase Agreement (PPA) Contract

*Aug 2011– Jan 2013*

## Step 3 - Final Reviews and Award

*Feb 2013 – June 2013*

## Step 4 - Design and Construction

*June 2013 – Dec 2014*





# THANK YOU

